

ARE THE BLIND SUPERIOR TO  
THE SEEING IN HEARING?  
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# Are the Blind Superior to the Seeing in Hearing?

A Much Discussed Question Reduced to Scientific Measurement by a Noted Expert

By JACOB KWALWASSER

A LITTLE over fifteen years ago Dr. Carl E. Seashore of the State University of Iowa conducted an experiment with sixteen blind students from the Iowa State College for the Blind, at Vinton, Iowa. He measured them in their localization of sound, discrimination for intensity of sound, discrimination for lifted weights, for passive pressure, for active pressure and for tactual space. He then compared the scores earned by these sixteen blind students with scores earned by fifteen high school students, chosen at random, from the Iowa City High School on the six tests enumerated above. The ages of the blind students ranged from sixteen to twenty-six and of the seeing from fourteen to nineteen. In selecting the blind, "only those were chosen who had been totally blind for more than five years, who were generally otherwise both mentally and physically sound and who were in high school grades."

Slight differences on the individual tests were found. In some measures, the blind were superior to the seeing and in others the seeing were superior to the blind. But there was no "significant constant tendency in the records to favor either the blind or the seeing." In other words, the blind and the seeing "under these circumstances are, on the whole, equally sensitive to direction of sound, intensity of sound, lifted weight, passive pressure, active pressure and tactual space."

## Wise Users of Wealth

TO THE best of the writer's knowledge this generalization of relative equality in sensory discrimination has never been questioned nor disturbed by later studies. Yet we are all aware of the fact that the blind are superior in their ability to use their touch, hearing and other senses for guidance. If we accept Dr. Seashore's generalization of equality, we may still explain the superior ability of the blind in touch and hearing by showing that even though the blind are not endowed with more capacity than the seeing, they acquire better use of these capacities than the seeing. This is, in fact, the very explanation presented by Dr. Seashore. To paraphrase it, we might show that the two groups are in possession of the same amount of psychological capital but that the blind make better investments of their "wealth" and realize more in return.

In the spring of last year, Mr. C. A. Hamilton, Superintendent of the New

York State School for the Blind, at Batavia, gave us permission to do some testing with the newly constructed Kwalwasser-Dykema Music Tests. We measured approximately seventy-five boys and girls ranging in ages from twelve to eighteen. The eight music tests measured were tonal memory, quality discrimination, intensity discrimination, tonal movement, time discrimination, rhythm discrimination, pitch discrimination and melodic taste. We then added an individual test measuring lifted weight discrimination.

## High Scores in Music

WHEN WE compare the scores earned by the blind on the music and weight tests with those published in the Manual (based upon earned scores of some five thousand grade and high school students of approximately the same age range) we find that the blind are superior to the seeing in every test which we gave them. Without a single exception, the scores are uniformly higher. In weight discrimination, tonal memory, quality discrimination, time discrimination, rhythm discrimination and melodic taste, the superiority of the blind is overwhelming. In the remaining traits, though the blind are superior they are not significantly so. The accompanying table is of particular interest:

TEST	MEAN	SIGMA
Tonal Memory		
Blind .....	17.48	2.96
Seeing .....	15.88	2.85
Quality Discrimination		
Blind .....	22.77	3.07
Seeing .....	21.39	2.72
Intensity Discrimination		
Blind .....	22.55	2.76
Seeing .....	22.10	2.81
Tonal Movement		
Blind .....	18.77	6.35
Seeing .....	17.71	5.04
Time Discrimination		
Blind .....	18.29	1.05
Seeing .....	17.63	2.93

Rhythm Discrimination		
Blind .....	18.87	2.57
Seeing .....	17.32	2.48
Pitch Discrimination		
Blind .....	26.50	3.97
Seeing .....	26.09	4.31
Melodic Taste		
Blind .....	14.52	3.12
Seeing .....	13.47	2.66
Lifted Weight		
Blind .....	29.09	3.78
Seeing .....	27.18	3.70

By statistical procedure, it is possible to discover the magnitude of the differences in scores just presented. Whenever the statistician speaks of a "significant difference" existing he has a very definite relationship in mind. He has found a difference in scores that is not likely to occur by chance or by accident. The difference must be so great that it is certain not to occur more than once in one hundred or more chances. The differences that we have found are such significant differences, and are likely to occur but once in four thousand chances.

## What One Does with What One Has

WE HAVE dealt at some length with our findings, for they appear to be in direct opposition to those presented by Dr. Seashore. If we employ the analogy of capital and earnings again, in the light of the second investigation, we are obliged to conclude that the reason the blind earn more on their native auditory and muscular equipment is because they actually have more capital invested. Dr. Seashore believes that it is necessary to factor out such considerations as training, experience, and special skill so that his tests will be "elemental."

However, a disembodied innate capacity, free from environmental influences, has never been isolated by the psychologist, and, as a matter of fact, a genuine "elemental" test is impossible of construction.

While we may wish to measure one's potential native endowment occasionally, what we usually actually do is to measure the use one makes of his native endowment. In other words, how much talent one possesses is commonly revealed by the use one makes of one's talent. The tester hopes that the subject will reveal the maximum amount of talent he possesses; but the tester also knows that this amount will approach the maximum but that it will not equal it. In the end we are not dealing with potentialities; we are dealing with actualities.

## Nature or Nurture?

IF WE admit that innate capacity is an abstraction and impossible of measurement without environmental influences helping or hindering the psychologist in his attempts at evaluation, we are ready for the second major problem. The writer maintains that the blind are not only superior in general musical ability but significantly superior on the nine objective tests. The question arises promptly, "Is this superiority due to better equipment, better use of equipment or both?" Such a discussion belongs more to the field of biology than psychology. This nature-nurture problem is constantly being approached from different angles. Are the blind superior in addition to compensate for their absence of vision? Were they born with better hearing or did they acquire better hearing as a result of their visual affliction?

It is quite unbelievable that blind children were born with superior auditory and muscular equipment. (Incidentally, many of these blind subjects were not totally blind; but they were all educationally blind.) It is equally unbelievable that total dependence upon the sense of hearing fails to develop finer skill in its use. It is not inconceivable, however, that judicious use may even improve the organs of hearing as it improves the efficiency of auditory operations. Are we potentially capable of acquiring more auditory and muscular discrimination? My findings lead inevitably to an affirmative answer.

## SELF-TEST QUESTIONS ON MR. KWALWASSER'S ARTICLE

1. Name five tests in which the blind show superiority over the seeing.
2. What is meant by a "significant difference"?
3. Why is it practically impossible to measure potential native endowment?
4. What is meant by the "nature-nurture" problem?

This very significant article is probably the first scientific exposition of a subject quite as interesting to the seeing as to the sightless. Institutions for the Blind, everywhere, make a specialty of musical instruction.



# Getting the Most from the Metronome in Piano Study

By JOSEPHINE MENEUEZ

FEW PEOPLE, either teachers or students, make any real use of that indispensable adjunct to piano study, the metronome. Some use it for technique alone, usually for velocity work, and others to obtain the tempo in an occasional piece of the same nature. But it is a rare teacher who uses it for all grades of pupils, and for both studies and pieces.

The item of cost is usually the reason for this neglect. All music teachers know how difficult it is to persuade the parents of prospective pupils to pay a fair price for lessons; and the additional cost of the metronome often seems to people of moderate means quite prohibitive. However, people can usually be persuaded to buy anything they really need, and parents must be convinced that this queer-looking device will be a real help to the student and that it will be used regularly, like the washing machine or the electric sweeper.

Once the metronome is obtained there are certain points to be considered in regard to its proper use. The tempo indicated on the music is usually too fast for students to practice by. This is due to the fact that the composers of teaching pieces are seldom men who have had any practical experience in working with young children. As a result the tempo indicated on the published copy is not that which comes easy to a child but that which is convenient for the composer who is possessed of a much more facile technique than a young student.

## The Practice Tempo

THE PRACTICE tempo should usually be considered slower than the playing tempo. We must learn to walk before we can run; and young children, beginners especially, in order to play correctly, must perform at what to the average adult seems a snail's pace. It is a big task to train a pupil to set notes, rests, dots, finger marks, and all the other signs and symbols which are before him

on the printed page; and this cannot be done if he insists upon rattling off his pieces in a tempo suited to an adult. This slow tempo, which should usually range from M. M. ♩ = 72 to M. M. ♩ = 92, at the start, can be gradually increased as the student acquires proficiency, until he reaches the proper playing tempo. However, the pupil should be able to play the piece fairly well, counting the time, before he uses the metronome, as this at first will tend to distract his attention.

The teacher should bear in mind that it is very difficult for young children to play more than one note to a beat, and the tempo for practice should be regulated accordingly. For example, in the Schmidt "Preparatory Studies," the exercises are given in sixteenth notes, and this should be the unit for practice. The pupil plays one note at each beat, the metronome set at ♩ = 92. In more advanced work, such as the Gurliitt and Czerny studies, two, three, or even four notes can be played to one beat.

Since the same applies to pieces, it might be well to illustrate by a few standard numbers generally used by music teachers. In May, by Behr, should be both practiced and played at ♩ = 92. In *Meadow Brook*, by Krogman, the left hand part is almost entirely in eighth notes; therefore the tempo will be ♩ = 92. The pupil should be required to count four half beats for the half notes at the end, and eight for the whole note. This tempo is good for both practice and performance.

## Two Notes to the Beat

THERE ARE some exceptions to the rule of playing one note to a beat. For instance, in *Airy Fairies*, by Spaulding, the metronome should be set at 72 or 80 for a quarter note, and the pupil should have special drill in playing the eighth notes, giving a strong accent to the main beat.

Another thing which the teacher should

always bear in mind is that tempos may vary a few degrees in different children. The lively, talkative child will require a faster tempo than the slow, quiet one; and while the teacher must guard against too great speed with the one, using the metronome as a check, the other will receive the help he needs in acquiring a velocity which is not a natural part of his make-up. For example, in *The Robin's Lullaby*, by Krogman, some children will be content to play the piece at ♩ = 92, with the middle part at ♩ = 108; while others like ♩ = 108 and ♩ = 120 better.

Convenient tempos for general use are the following: 52, 60, 72, 80, 92, 108, 120, 132, 144, 152, and 160. A range of from 72 to 120 is usually sufficient for young pupils, as it is best to wait until the child is nine or ten years of age before attempting velocity work. Unusually precocious pupils are, of course, exceptions, and should be treated as such.

It is better not to pay much attention to the tempo markings of *presto*, *allegro*, *andante*, and so forth, on the metronome, as these terms are very elastic, and often vary greatly with both composition and performer.

## Acquiring Velocity

IN MASTERING *Taranella in A Minor* by Pieczonka (a number requiring considerable velocity), a pupil who is a slow reader will start at about 120 for an eighth note, working gradually up to about ♩ = 152. At this point the unit is shifted to a dotted quarter, which makes it ♩ = 72 or 80, giving three notes to a beat. After the pupil becomes proficient at this tempo, the speed is gradually increased until he is playing, as fast as he can without mistakes. A good reader can start with ♩ = 152, changing after a few lessons to the two beats a measure. The speeds of all numbers requiring much velocity vary greatly with different pupils to whom it is well to give

a certain leeway in the matter of tempos. It should also always be impressed on the pupil that the metronome has no feelings and does not mind in the least if an occasional beat is missed in finding a note, or in slowing up in a difficult passage.

## When Rubato Rules

THE OBJECTION, sometimes heard, that using a metronome tends to make a player mechanical is not founded on facts. Indeed, the students who play the most artistically are those who have been the most faithful in the use of their metronomes when learning their pieces. As they become more advanced, however, this use can be gradually discontinued. For, having acquired a good sense of rhythm and a habit of slow, careful practice, it is easy for them to cultivate a more rubato style in compositions where it is required. Even young pupils can be trained to retard or accelerate, or even to disregard the metronome entirely when the interpretation requires such free treatment.

The use of the metronome is a matter that requires real study. The teacher must observe and experiment continually, bearing in mind the fact that piano playing in the foundational stages is largely a matter of science. But, once he has taught the pupil to "put the right finger on the right note at the right time," as Rabinstein once expressed it, he will have the satisfaction of building on this solid foundation such a structure as will in time produce the well-rounded artist.

## SELF-TEST QUESTIONS ON MISS MENEUEZ' ARTICLE

1. Why are the tempo indications on pieces usually not practicable for the pupil?
2. What note value should be considered as the unit for counting?
3. How may the metronome be a means toward acquiring velocity?
4. When may the use of the metronome be omitted?

# Shoot Straight at the Target

By ARTHUR OLAF ANDERSEN

IS THERE enough concentration in our study these days or do we direct our attention into so many channels that the ultimate attainment of one big purpose is prevented? To do one thing superlatively well, so thoroughly and earnestly that it becomes the vital thing in life, is the only way to become an artist.

Not long ago a lady came to the conservatory and enrolled for piano and theory. The following week she added violin instruction and two days after, trumpet and voice lessons. But when she attempted to sign up for weekly lessons upon the organ, the president of the school called her into his office and wanted to know what it was all about. It seemed that the lady had been in China and was intending to return to teach music. She felt that she would have to be a whole musical conservatory in herself, as her experience had brought out the fact that

there were very few music teachers in the Orient and much demand for instrumental instruction.

## A Heavy Schedule

THE PRESIDENT shook his head ominously, but since her reason for desiring knowledge concerning each of these instruments seemed plausible, and since the conservatory advertised instruction in all branches with no restriction upon the number any one individual might study, he could offer no objections.

The result was a calamity! The lady could not practice sufficiently on any one instrument to do justice to herself or her teachers. She had so many lessons that she had to be at the conservatory every day in the week. She was constantly mislaying her time schedule so that she lost lessons. She became irritable and nervous and finally withdrew from the conserva-

tory. The moral of her experience is not at all difficult to grasp. She meandered along the way instead of pursuing one major goal and consequently failed to reach any goal.

## Dissipating Energy

MANY A STUDENT wants to divide his effort between the one thing to which he is actually suited and some other form of musical expression, a doubling up that never results satisfactorily, for his attention is distracted and a great deal of precious time and energy wasted that could be expended to better advantage in perfecting the main objective. This does not mean that a piano student should study only the piano, for there are a number of tributary branches of work in connection with pianistic musicianship that go hand in glove with it and are as necessary as

the actual digital work at the keyboard. Without such branches of study as harmony, harmonic analysis, solfeggio, form, canon and fugue, and even orchestration, the student is simply and wholly a mechanical player and will always remain so.

It is wise for the musician to keep in mind the rules to study anything and everything that pertains to advancement in the one main endeavor and to concentrate upon using the material studied in promotion of and application to the instrument he has chosen. If he takes his work seriously and gives it the necessary time and attention he will find himself altogether too busy with and too interested in his own work to meander through other fields where it may seem pleasant to stroll but where, after all, he does not belong.

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KWALWASSER, JACOB

AUTHOR

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